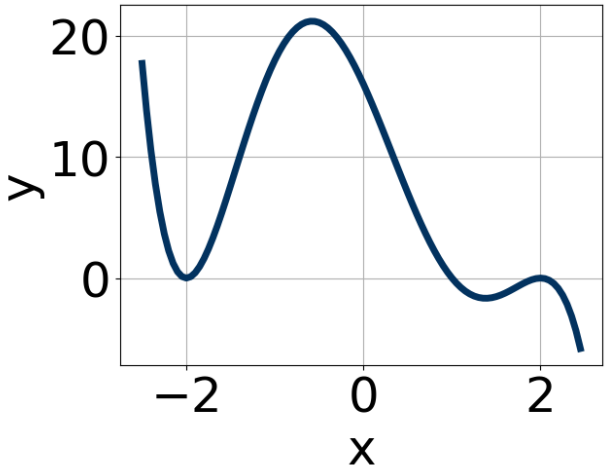
1. Which of the following equations *could* be of the graph presented below?



A. $-13(x-2)^{10}(x+2)^{5}(x-1)^{10}$

B. $-14(x-2)^{10}(x+2)^{9}(x-1)^{11}$

C. $18(x-2)^{10}(x+2)^{4}(x-1)^{10}$

D. $-6(x-2)^{10}(x+2)^{4}(x-1)^{7}$

E. $16(x-2)^{8}(x+2)^{8}(x-1)^{5}$

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2. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form ax^3+bx^2+cx+d.

$$\frac{-3}{5}, \frac{7}{4}, \text{ and } \frac{1}{3}$$

A. $a \in [53,63], b \in [-91,-78], c \in [-46,-37],$ and $d \in [-21,-18]$

B. $a \in [53,63], b \in [-91,-78], c \in [-46,-37],$ and $d \in [20,23]$

C. $a \in [53,63], b \in [83,95], c \in [-46,-37],$ and $d \in [-21,-18]$

D. $a \in [53,63], b \in [49,51], c \in [-88,-79],$ and $d \in [20,23]$

E. $a \in [53,63], b \in [-165,-159], c \in [107,112],$ and $d \in [-21,-18]$

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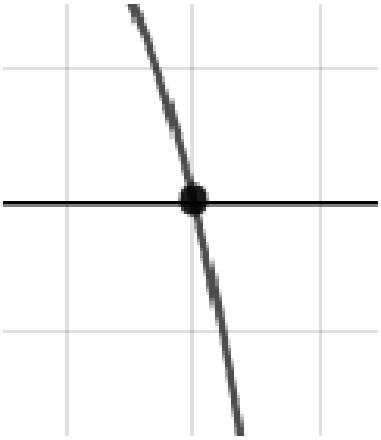
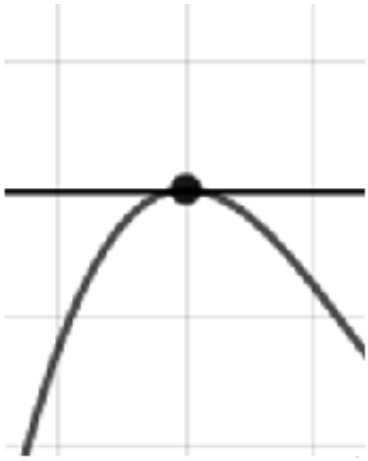
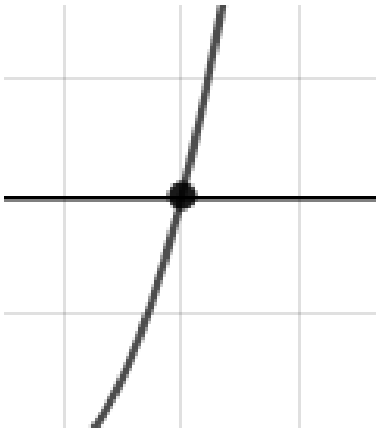
3. Describe the zero behavior of the zero $x = 8$ of the polynomial below.

$$f(x) = 3(x+8)^8(x-8)^{11}(x-7)^9(x+7)^{13}$$

A. 

C. 

B. 

D. 

E. None of the above.

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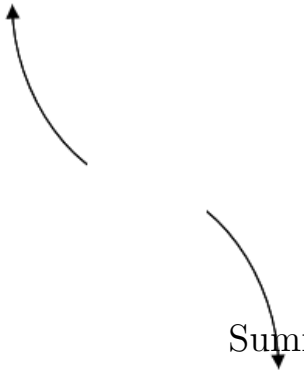
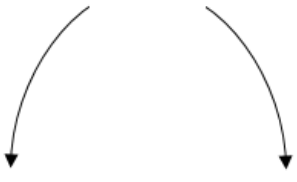
4. Describe the end behavior of the polynomial below.

$$f(x) = -4(x+6)^4(x-6)^5(x+2)^5(x-2)^5$$

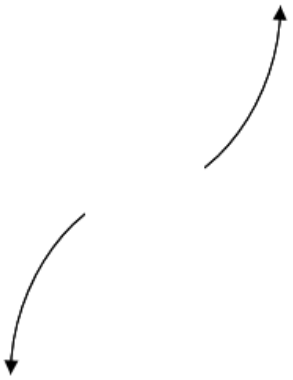


A.

B.



D.



C.

E. None of the above.

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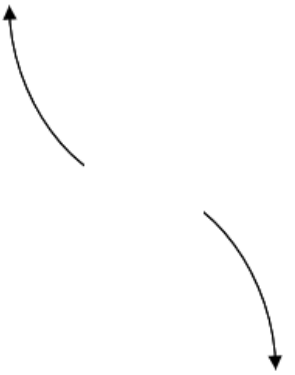
5. Describe the end behavior of the polynomial below.

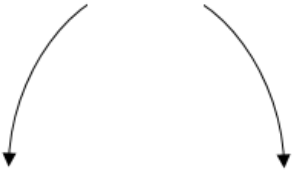
$$f(x) = 4(x+2)^5(x-2)^8(x+9)^3(x-9)^3$$

A.

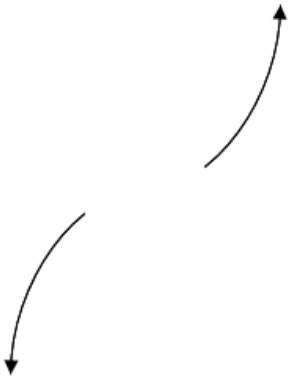


C.

B.



D.



E. None of the above.

6. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$-5 + 5i \text{ and } -1$$

A. $b \in [-16, -10], c \in [59, 67],$ and $d \in [-58, -48]$

B. $b \in [4, 19], c \in [59, 67],$ and $d \in [46, 58]$

C. $b \in [-8, 6], c \in [-1, 13],$ and $d \in [3, 6]$

D. $b \in [-8, 6], c \in [-6, 3],$ and $d \in [-7, 3]$

E. None of the above.

7. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{-2}{5}, \frac{-3}{2}, \text{ and } \frac{1}{5}$$

A. $a \in [48, 62], b \in [44, 50], c \in [-44, -38],$ and $d \in [1, 10]$

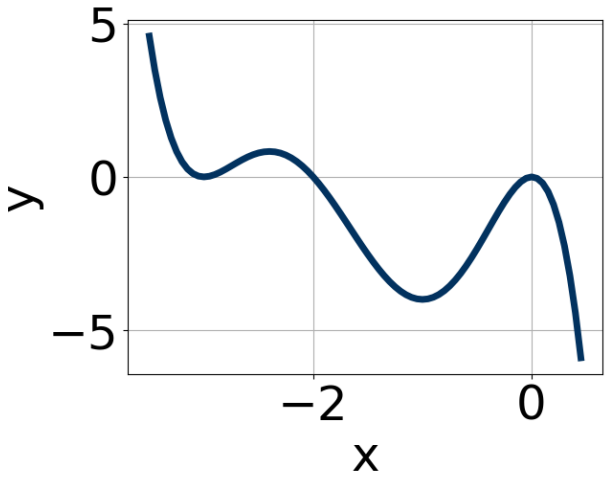
B. $a \in [48, 62], b \in [-106, -98], c \in [42, 50],$ and $d \in [-8, 2]$

C. $a \in [48, 62], b \in [79, 88], c \in [7, 18],$ and $d \in [-8, 2]$

D. $a \in [48, 62], b \in [79, 88], c \in [7, 18],$ and $d \in [1, 10]$

E. $a \in [48, 62], b \in [-85, -84], c \in [7, 18],$ and $d \in [1, 10]$

8. Which of the following equations *could* be of the graph presented below?



A. $14x^{10}(x+3)^{10}(x+2)^5$

B. $18x^{10}(x+3)^4(x+2)^4$

C. $-11x^9(x+3)^6(x+2)^5$

D. $-13x^8(x+3)^{10}(x+2)^5$

E. $-8x^{11}(x+3)^{10}(x+2)^{10}$

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9. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$4 - 3i \text{ and } 3$$

A. $b \in [9, 12], c \in [40, 52],$ and $d \in [74, 86]$

B. $b \in [-14, -5], c \in [40, 52],$ and $d \in [-77, -72]$

C. $b \in [0, 3], c \in [0, 5],$ and $d \in [-9, -8]$

D. $b \in [0, 3], c \in [-10, -6],$ and $d \in [7, 16]$

E. None of the above.

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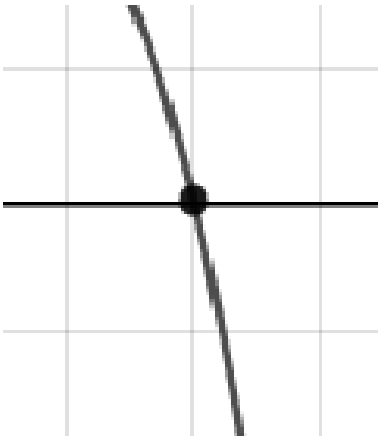
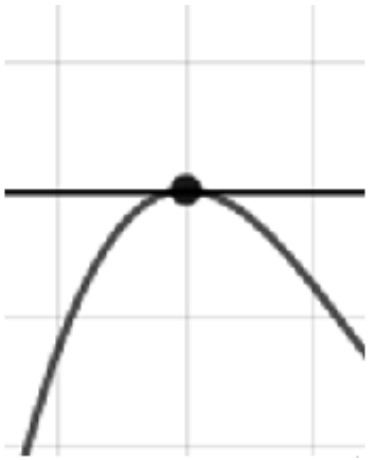
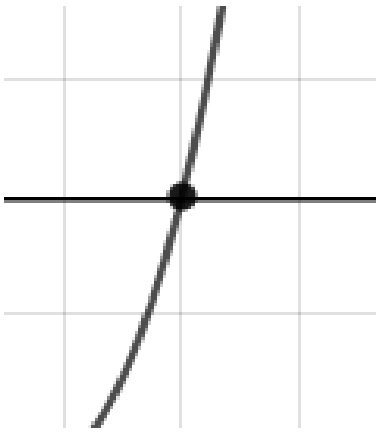
10. Describe the zero behavior of the zero $x = 3$ of the polynomial below.

$$f(x) = 3(x-3)^5(x+3)^{10}(x+8)^5(x-8)^6$$

A. 

C. 

B. 

D. 

E. None of the above.
